

Space Debris Threat Mitigation via characterization of strain rate effects by Maximum Entropy Atomistics

Completed Technology Project (2017 - 2019)



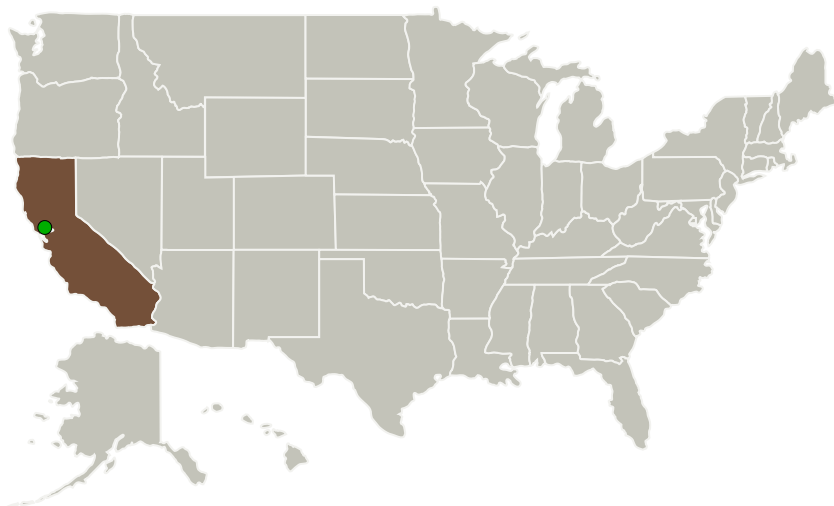
Project Introduction

Space Debris and micrometeoroid threat mitigation poses a significant and growing future challenge to virtually all NASA missions. As such, there is a direct need to understand the mechanics and physics of any such impact events. However there is an inherent difficulty in understanding strain rate effects using small scale physics model due to the extremely short timescales involved when considering atomic motion. We propose a methodology, maximum atomistics, which takes into account in an average sense the extremely short timescales and allows prediction of atomic motion over much longer timescales, namely those of interest in impact threat mitigation.

Anticipated Benefits

This methodology allows prediction of atomic motion over much longer timescales, namely those of interest in impact threat mitigation. This could be useful for space debris and micrometeoroid threat mitigation.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
California Institute of Technology(CalTech)	Lead Organization	Academia	Pasadena, California
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations

California

Project Website:

<https://www.nasa.gov/strg#.VQb6T0jJzyE>

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

California Institute of Technology (CalTech)

Responsible Program:

Space Technology Research Grants

Project Management

Program Director:

Claudia M Meyer

Program Manager:

Hung D Nguyen

Principal Investigator:

Michael Ortiz

Co-Investigator:

William J Schill

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Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
 - └ TX11.3 Simulation
 - └ TX11.3.7 Multiscale, Multiphysics, and Multifidelity Simulation

Target Destination

Earth